Era Aviation, Inc.

PROCESS SPECIFICATION

ERA AVIATION, INC.

GULF COAST DIVISION
LAKE CHARLES, LOUISIANA

PROCESS SPECIFICATION NO. 2004
FABRICATION OF FIRE RETARDANT COMPOSITE LAMINATE

TYPES I thru VI

Prepared By: Dave Murphy Date: 7-30-96
Dave Murphy

Approved By:
Quality Control: Dave Murphy Date: 8-1-96
Dave Murphy

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Peter Schwartz Jr.

DATE	ENGINEERING ORDER	E.O. No.	SHT.
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BY D. MURPHY	TITLE PROCESS SPECIFICATION 2004	DWG. AFFECTED NA	
APPROVED BY		ENTERED ON COMPUTER BY: DATE:	

REASON FOR CHANGE: TO CORRECT DESCRIPTION

CROSS OUT THE WORD "MOLD" ON STEP 10 OF TYPE I AND INSERT THE WORD "PART".

ACCOMPLISHED THE SAME CHANGE FOR THE FOLLOWING TYPE LAYUPS:

TYPE II	CHANGE STEP 12
TYPE III	CHANGE STEP 14
TYPE IV	CHANGE STEP 16
TYPE V	CHANGE STEP 18
TYPE VI	CHANGE STEP 20

ADD CHANGE TO UNINCORPORATED LIST	DATE	BY
ADD CHANGE TO MASTER DRAWING LIST	DATE	BY
ADD CHANGE TO COMPUTER DATA BASE	DATE	BY

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LOG OF REVISIONS

REVISION	DATE	DESCRIPTION	APPROVED DATE
IR	7/30/96	INITIAL RELEASE	8/6/96

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Scope

This specification outlines the requirements for fabricating a fire retardant composite laminate that meets the minimum fire retardant requirements of FAR 29.853. This Process Specification includes multiple layered combinations of fiberglass chopped strand mat and fiberglass edge glass (ECDE). The selections are identical in all respects. Each type, I-VI will provide one additional layer of ECDE glass and fiberglass mat than the preceding type.

All layups will include the fire retardant materials and may be used internally and externally on the aircraft.

Conformation

This specification does not conform to any existing government specification.

Conflicts

In the event of a conflict with engineering drawing(s) and this specification, the drawing(s) shall govern.

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MATERIALS

MATERIAL	NAME	MANUFACTURER
Resin	Derakane 8084	Dow Chemical Midland, MI
Promoter	Cobalt Napthenate	AKZO Chemie New Brunswick, NJ
Accelerator	Dimethylaniline	Buffalo Colors West Paterson, NJ
MEKP Catalyst	Hi Point 90	Witco Chemical Richmond, CA
	Lupersol DHD 9	Lucidol Chemical Buffalo, NY
Mold Release	PVA	Rexco Carpenteria, CA
	Frekote 700	Dexter Corp. Seabrook, NH
	Ceara Mold Release Wax	Ceara Products, Inc. Denver, CO
UV Inhibitor	UV-9	Industrial Chemicals Atlanta, GA
Pigment	CoPlas Pigment	CoPlas Fort Smith, AR
	Spartan Pigment	Spartan Pigments Houston, TX
Gel Coat	Gel Coat	CoPlas Inc. Ft. Smith, AR
3/4 oz. Type "E" Glass Mat (Chopped Strand Mat)	M113 - 3/4 oz. or M127 - 3/4 oz.	Certainteed Wichita Falls, TX
1 1/2 oz. Type "E" Glass Mat	MPM - 1 1/2 oz. or M127 - 1 1/2 oz.	PPG Industries Shelby, NC

MATERIALS

MATERIAL	NAME	MANUFACTURER
8.9 oz. Type "ECDE" glass	7781	Burlington Fibers Altavista, VA
		Hexcel Corp. Pleasanton, CA
Fire Retardant Additive	Nyacol APE-1540	PQ Corp. Ashland, MA
Fire Retardant Additive	Decabromodiphenyl Oxide	Ethyl Corp. Magnolia, AR
Grinding Discs	36 Grit Type D 60 Grit Type C 80 Grit Type C	3M Corp. St. Paul, MN
Mold Surface	Black Tooling Gel	Glidden

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Laminate Manufacture - Type I .070 AVG

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

9. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

10. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils to fill exposed pits. Finish with 180 grit wet or dry sandpaper. PART

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Laminate Manufacture - Type II .100 AVG

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Apply 3rd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

9. Apply 4th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

10. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

11. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

12. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils, to fill exposed pits. Finish with 180 grit wet or dry sandpaper.

PART

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Laminate Manufacture - Type III .125 AVG

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Apply 3rd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

9. Apply 4th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

10. Apply 4th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

11. Apply 5th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

12. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

13. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

14. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils, to fill exposed pits. Finish with 180 grit wet or dry sandpaper.

PART

Laminate Manufacture - Type IV .150 AVG.

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Apply 3rd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

9. Apply 4th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

10. Apply 4th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

11. Apply 5th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

12. Apply 5th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

13. Apply 6th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

14. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

15. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

16. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils, to fill exposed pits. Finish with 180 grit wet or dry sandpaper.

PART

Laminate Manufacture - Type V .180 AVG

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Apply 3rd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

9. Apply 4th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

10. Apply 4th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

11. Apply 5th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

12. Apply 5th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

13. Apply 6th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

14. Apply 6th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

15. Apply 7th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

16. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

17. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

18. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils to fill exposed pits. Finish with 180 grit wet or dry sandpaper.

PART

Laminate Manufacture - Type VI .250 AVG

1. Inspect mold for defects (i.e. chips, cracks, crazing, etc. . . .). Do Not proceed until any defect is corrected.

2. Apply mold release agent(s) according to manufacturer's instructions.

3. Apply one layer of 3/4 oz. chopped strand mat on mold surfaces. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

4. Apply one layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

5. Apply 2nd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

6. Apply 2nd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

7. Apply 3rd layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

8. Apply 3rd layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

9. Apply 4th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

10. Apply 4th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

11. Apply 5th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

12. Apply 5th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

13. Apply 6th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

14. Apply 6th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

15. Apply 7th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

16. Apply 7th layer of ECDE glass cloth. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

17. Apply 8th layer of 3/4 oz. chopped strand mat. Saturate with Derakane 8084 resin containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, UV inhibitor and pigment. Deaerate with serrated rollers.

18. Allow to cure for 4 - 6 hours. Separate from mold and trim to size.

19. Sand part with 40 grit sandpaper to smooth out mold marks and expose any pits that might be present.

20. Apply gel-coat containing 12% by weight Decabromodiphenyl Oxide, 7.5% by weight Nyacol APE 1540, pigment and UV inhibitor onto mold using a spray gun for a nominal thickness of 10 mils, minimum thickness of 6 mils, to fill exposed pits. Finish with 180 grit wet or dry sandpaper.

PART

LAP JOINTS

The following instructions are used to permanently join laminate structures together.

Lap Joints:

1. Scuff areas to be joined with 36 grit grinding disc.
2. Apply one layer of 1 1/2 oz. mat. Saturate with 8084 resin.
3. Apply 2nd layer of 1 1/2 oz. mat. Saturate with 8084 resin.
4. Install mating component.
5. Apply pressure to squeeze excess resin from lap joint.
6. Allow a minimum of 2 hours to exotherm.

INSPECTION

It is in purpose of the inspection to verify that each part has been fabricated in accordance with and meets the requirements of this specification.

RESPONSIBILITIES:

It is the responsibility of the fabricator to make available to Era Aviation or his authorized representative any or all of the following:

Records: Records pertaining to the part (s) being purchased shall be supplied when requested. These may include:

Materials Specifications
Equipment drawings or mold jig
Materials test results
Dimensional verification reports
Rework and repair reports.

MATERIALS:

Raw materials used for laminates shall be virgin materials and shall be free of contaminants as described in pgs. 2 and 3.

FABRICATED PARTS:

The part to be inspected shall be properly located and positioned, and shall be in condition to permit safe and thorough inspection. Reasonable means shall be provided to permit the inspector to visually examine the entire inner and outer surfaces of the part.
Allowable defects are listed on page 16.

The following inspection tools and equipment shall be made available for use by the inspector.

Barcol hardness tester
Acetone squeeze bottle with acetone
Extension cord with ground fault switch
A vapor tight inspection light
Thickness gauge

INSPECTION

TEST OF FINISHED PARTS:

The following basic tests shall be included as a minimum in the Acceptance Inspection.

Barcol Hardness Test - A test of resin cure shall be made in accordance with ASTM D2583. Take 10 readings, discard highest and lowest, average the remaining readings. Minimum acceptable average reading is 30.

Surface Cure Test - An acetone test shall be used to detect surface inhibition on surfaces exposed to air during cure. The procedure that shall be used is the following: rub a few drops of acetone on the surface and check for tackiness after the acetone has evaporated. Persistent tackiness indicates incomplete cure.

Dimensions - The inspector shall be provided with copies of all approved drawings or mold jigs.

OTHER APPLICABLE DOCUMENTS:

ASTM Standards

C 581-74-Test Method for Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures.

D 638-77a-Test Method for Tensile Properties of Plastics.

D 790-71-Test Methods of Flexural Properties of Plastics and Electrical Insulating Materials.

D 883-78a-Definitions of Terms Relating to Plastics.

D 2583-75-Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

ALLOWABLE DEFECTS

Defect	Surface Inspected
Cracks (through part)	None
Crazing (fine surface cracks)	Max dimension 1/2 in., max density 5 per sq. ft. min 2 in apart
Blisters (rounded elevations of the laminate surface over bubbles)	Max 1/4 in., dia X 1/8 in. high, max 1 per sq. ft. min 2 in apart
Wrinkles and solid blisters	Max deviation, 20% of wall thickness but not exceeding 1/8 in.
Pits (craters in the laminate surface)	Max dimensions, 1/8 in dia X 1/16 in deep. max density 10 per sq. ft.
Surface porosity (pinholes or pores in the laminate)	Max dimensions, 1/16 in dia X 1/16 in deep, max density 10 per sq. ft.
Chips	Max dimension of break, 1/4 in. and thickness no greater than 20 percent of wall thickness, max density 1 per sq ft.
Dry spot (nonwetted reinforcing)	Max dimension, 2 sq in. per sq ft
Entrapped air (bubbles or voids in the laminate)	1/8 in. max dia. 4 per sq. in. max density; 1/16 in. max dia. 10 per sq. in. max density
Exposed Glass	None
Burned Areas	None
Exposure of cut edges	None
Scratches	Max length 1 in. max depth 0.010 in.
Foreign Matter	1/16 in. dia. max density 1 per sq ft.

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FIBERGLASS CHOPPED STRAND MAT

1.0 Scope

1.1 The scope of these procedures is to describe the visual, physical and mechanical parameters which characterize fiberglass surfacing mat used by the fabricator.

2.0 Definitions

2.1 Chopped Strand Mat - Chopped strand mat is made from randomly oriented glass strands which are held together in mat form using a binder. Each strand contains a sizing.

3.0 Requirements

3.1 Visual Requirements - Each roll of chopped strand mat shall be inspected to insure it is consistent in color, texture and appearance. It shall be free from surface irregularities, fluffy masses, dirt spots or other foreign material; water spots, knots, binder spots larger than 2" in diameter, clumps of strands and tears of holes which may result from removal of defects.

3.2 Physical Requirements

3.2.1 Weight - The square foot weight of the mat shall be measured for each carton of mat used. All specimens shall fall within the range specified for the product.

3.3 Packaging Requirement - Packaging shall be visually inspected to assure proper labeling and that the package is free from damage that may render the mat unusable.

3.3.1 The mat shall be packaged in an unbroken carton as shipped from the mat manufacturer's factory. The mat used shall not be repackaged in the distribution of the mat after the manufacturer has shipped the mat.

3.4 Documentation - It is the responsibility of the fabricator to maintain records showing the results of all material testing. This information shall show at a minimum, the following:

a. Form of material
b. Manufacturer
c. Manufacturer's product description including binder type
d Manufacturer's product code
e Production date, if available, or production code on carton
f Property measured and value recorded
  * Visual inspection
  * Width
  * Thickness
  * Packaging
g Job number (Internal Fabricator Control Number)
h Fabricated part identification number

FIBERGLASS EDGE GLASS

1.0 Scope

1.1 The scope of these procedures is to describe the visual, physical and mechanical parameters which characterize ECDE glass used by the fabricator.

2.0 Definitions

2.1 Fiberglass ECDE glass - Glass fiber rovings woven into a heavy weight fabric.

2.2 Wrap ends - The rovings which run in the longitudinal direction of the fabric, i.e., along the roll length of the fabric.

2.3 Fill Picks - The rovings which run in the transverse direction of the fabric, i.e., across the roll length of the fabric.

2.4 Leno Strands - A pair of warp ends at each edge of the woven fabric. One leno wrap end is always over each fill pick while the other Leno wrap end is always under the fill pick. The Leno strands define the edges of the woven field and serve to stabilize the edges of the fabric.

3.0 Requirements

3.1 Visual Requirements

3.1.1 Dirt Spots - Defined as all foreign matter, dirt, grease spots, etc. - The average number of dirt spots (1/16" to 3/4" in diameter) per 100 lineal feet shall be 6 or less. All rolls shall be free of dirt spots in excess of 3/4" diameter.

3.1.2 Warp Ends - All rolls shall be free of missing warp ends for more than two consecutive feet.

3.1.3 Fill Picks - All rolls shall be free of consecutive missing picks in excess of five, or more than eleven missing picks, either individual picks or any combination of individual and multiple (2, 3, 4, or 5) picks, in any consecutive 100 lineal feet.

3.1.4 Fuzz Clumps and Loops - The product is designed to exhibit proper laydown and shall be free of fuzz clumps or loops exceeding one inch in height from the surface.

3.2 Physical Requirements

3.2.1 Thickness - The thickness of the mat in each roll of ECDE glass shall be measured.

3.3 Packaging Requirement - Packaging shall be visually inspected to assure proper labeling and that the package is free from damage that may render the ECDE glass unusable.

3.3.1 The ECDE glass shall be packaged in a unbroken carton as shipped from the manufacturer's factory. The ECDE glass used shall not be repackaged in the distribution of the ECDE glass after the manufacturer has shipped the ECDE glass.

3.4 Documentation - It is the responsibility of the fabricator to maintain records showing the results of all material testing. This information shall show at a minimum, the following:

a Form of material
b Manufacturer
c Manufacturer's product description including binder type (treatment)
d Manufacturer's product code
e Production date, if available, or production code on carton
f Property measured and value recorded
  * Visual inspection
  * Width
  * Thickness
  * Packaging
g Job number (Internal Fabricator Control Number)
h Fabricated part identification number